Horizon 2020 Intelligence for Forum för Innovation inom transportsektorn

Final Report
Forum has assigned IMCG to:

1) Identify relevant calls in H2020 in line with the Swedish mobility and transport roadmaps.

2) Find differences between the Swedish transport and mobility R&I ambition and H2020 ambition.

The focus of this document is on:

- Upcoming relevant calls in the transport sector in the Horizon 2020 EU framework during 2015 in the prioritised areas of the Forum constellation

- Identification of areas/topics/subjects for the Forum consortia to select H2020 calls in the future (2016-2017)
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Introduction

The aim of this intelligence work is to:

1) Identify calls in the Horizon 2020 framework in 2015 that match Forum roadmaps Key Activities.
2) Identify Key activities from Forum roadmaps, which are not covered in the Horizon 2020 framework in 2015.

In addition, some calls that were relevant for the scope of the roadmaps which have a deadline in the last quarter of 2014 are also included.

Results

1. We identified 25 calls, with a total EC-contribution of about €640M in the Horizon 2020 framework in the last quarter of 2014 and 2015, which cover Forum areas.

2. We also identified a number of areas mentioned in the roadmaps, which are not covered in the Horizon 2020 funding programs, which are:

   - E-business and home deliveries
   - Remotely Operated Vehicles (partly covered in the Blue Growth program, Maritime research)
   - Long Combination Vehicles
   - HCT – High Capacity Transport

As we understand it, HCT and Long Vehicles have been pushed for in earlier FP’s by Swedish organisations, while the issues due to increased E-business and home deliveries have not. See annex 1, for further information regarding the selection and documentation.

3. Finally we identified one area which is covered by the Horizon 2020 program but not in the Forum Roadmaps, which is is the focus area of Transport societal drivers. For further information please read Annex 2

4. In the interview with Swedish transport and mobility H2020 stake-holders the Vinnova Mobility for Growth opportunity surfaced. This calls supports experienced researcher careers through mobility and international industrial collaborations.
Opportunities for Forum in Horizon 2020

Horizon 2020 framework and Forum roadmaps focuses

Our Approach

We gathered and scanned all drafts for different Horizon 2020 work programmes:

- Secure, clean and efficient energy
- Energy challenge
- Future and Emerging Technologies
- Food security, sustainable agriculture, marine and maritime research and the bio-economy
- Health, demographic change and wellbeing
- Leadership in Enabling and Industrial Technologies - Information and Communication Technologies
- Europe in a changing world – inclusive, innovative and reflective Societies
- Leadership in enabling and industrial technologies - Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing
- European research infrastructures (including e-Infrastructures)
- Climate action, resource efficiency and raw materials
- Smart, green and integrated transport

For each roadmap, we identified areas to be covered by the Horizon 2020 programs’ scanning in order to identify the connections between the roadmaps and Horizon 2020 calls in late 2014 and 2015.

Results

Below we present the selected key words and combination of words used from each roadmap scanning the H2020 work-programmes presented above, followed by a section of selected relevant calls.

City Logistics – Goods transports in an urban area
- Situation analysis
- Business in cities
- Mixed/shared loading
- Improve the conditions for business in cities
- E-business and home deliveries
- Develop methods to reduce negative effects of business transports despite growth
- Energy efficiency regarding transport for waste, construction and facilities
- Develop vehicle concept for good distribution in urban environment
Future Bus Systems
- ICT
- Infrastructure
- Automation of tickets
- Silent and energy efficient vehicles
- Security systems
- Passenger exchange – disabled people
- Self sufficient modular vehicle structure

HCT Railways: Development of good transports on railways and combination transport
- International goods corridors
- Making longer, more efficient and heavier trains
- Existing and coming infrastructure
- Fast trains
- Automatic coupling

Electrification of Road Transports
- Energy efficiency
- Electrified vehicles
- Automotive industry
- Smart cities

Green Train
- High speed green train by 2020
- Interaction with the infrastructure
- Energy supply
- Engine technology
- Design
- Thin wall technology
- Energy efficiency
- Increase passenger capacity
- Safety / reliability

Sustainable Fuels for Transportation in Sweden
- Alternative fuels
- Biomass

Traffic Control
- Control and management systems for different modes of transport
- Intermodal solutions for traffic control/management
- ICT, new digital solutions for information sharing
- Efficient personal and goods transports
- Optimisation and reloading of goods and passengers
- Nods / hotspots
- Route planning
- H2M Interaction
- Operational safety
- Weather routeing
- E-navigation

**HCT Roads**
- Long Combination Vehicles - LCV
- Adjust/adapt Goods / Freight reception
- Adapt terminals, roads, ports, airports, and traffic control
- Customised stations, rest areas, shipment terminals
- HCT multimodal: and Green multimodal corridors

**Infrastructure Adaptation**
- Green corridors, separated files, segregated routes for heavy vehicles
- Green flows, green light-wave, time slots
- Prioritised routes, smaller roads
- Characteristics of the vehicles against the infrastructure in place
- Road network for HCT-vehicles

**Information systems**
- 'Track and trace'
- Adapt production and logistics control
- Intelligent Access Program (IAP) certified telematics boxes
- Developed driver support
- Geographical information systems (GIS) - advanced ICT - IT combinations with mobile technology
- ECO-driving
- Increased night distribution
- Avoid 'stop and go' driving, traffic jams and intersections

**HCT Logistics**
- Logistics structure
- Develop specific HCT Structure
- Develop HCT systems for different types of goods
- The loading and unloading techniques.
- Co-modality, semitrailers, optimized trailers, Collaboration with other modes: maritime, rail, air
- Accessibility to the terminal. Hours of operation, reliability, security, parking spaces
- Intelligent transport, ICT, RFID,

**Rules and regulations**
- Carbon dioxide emissions and energy usage
- Decarbonisation
- Urban passenger transport
– Long-distance freight transport
– Renewables in the energy pool
– Transport schedules
– Urban accessibility
– Safety
– Fatalities and severe injuries
– Cargo

Drivers of innovation on liberalized rail market
– Climate
– Innovative business
– Risk sharing - between participating actors
– Pricing of infrastructure (of tracks, track vehicles, etc)
– Differentiated pricing
– Energy efficient transport system
– Cooperation structures for systems integration
– Changes in EU-regulation

Connected and interoperable transports
– Connected road
– Remotely operated vehicles
– Connected vehicles
– Connected traffic control / management
– Connected logistics
– Smart public transport
List of relevant calls

How to read!
In order to make your navigation in the document easier, part of the scope and expected impacts matching with the roadmaps are highlighted in yellow:

Glossary:
MG: Mobility for Growth
NMP: Nanotechnologies, Advanced Materials and Production
LEIT: Leadership in Enabling and Industrial Technologies
SCC: Smart Cities and Communities
ICT: Information and Communication Technologies
IT: Information Technologies
DRS: Disaster Resilient Societies
GV: Green Vehicles
LCE: Low Carbon Economy
Selected calls

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MG.3.6a-2015. Safe and connected automation in road transport

Relevant Forum Roadmap: City Logistics - High Capacity Transportation (HCT) Roads (Information Systems – Impact) - Connected and interoperable transports
Deadline: 31st of March 2015

Specific Challenge: Automated and progressively autonomous driving applications in road transport, actively interacting with their intelligent environment could provide an answer to the EU objective of reconciling growing mobility needs with more efficient transport operations, lower environmental impacts and increased road safety. Automation in road transport should make best use of the evolution of Cooperative ITS and the benefits made available by satellite navigation systems, such as the increased accuracy and robustness. Connectivity and cooperative mobility will be the key driving force for integrating automation into novel mobility concepts enabled by the European Wide Service Platforms (EWSP). Security and safety aspects of these systems are also crucial.

Scope: Proposals could be Research and Innovation Actions or Coordination and Support Actions. Research and Innovation Action proposals should address one or more of the following aspects to support gradual progress towards full automation:
- Dedicated supporting technologies for individual pre-emption or compensation of human errors, or even taking over the vehicle control in case of imminent collision. This could include: Advanced Driver Assistance Systems (ADAS) to support drivers in accident avoidance and to mitigate the consequences of collisions, including tools to detect and measure undesirable or unusual driver condition (such as drowsiness) and warn, control and correct that behaviour at different levels; better optimised Human Machine Interfaces (HMI), providing tailor-made information which the driver is capable of processing in continuously changing conditions.
- Novel transport, service and mobility concepts in real-life situations enabled by automated driving and connectivity. These services and concepts could benefit from cloud computing and data management and data aggregation techniques for road transport big data. They could also include automation specific to the road freight sector, including smart, secure on-board and infrastructure based-systems and seamless integration with other modes. In this context, particular attention could be given to demonstrating freight services/road trains. Attention should be paid to understanding and addressing the responses of users.

All proposals should include an assessment of the effectiveness of the relevant solutions in real life conditions based on a multi-stakeholder engagement process, in particular involving drivers. Ethical and gender issues in compensating for human errors should be duly taken into consideration.

Coordination and Support Action proposals should address one or more of the following aspects:
- Dissemination and take-up of results, including the development and consensus building on business models to progress towards full automation in road transport.
- Liability and standardisation policy and regulatory framework recommendations could be formulated as appropriate.

In line with the Union's strategy for international cooperation in research and innovation international cooperation is encouraged.
The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 10 million each for Research and Innovation Actions would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact: Reduction of the automated driving systems’ development costs, as well as raising competitiveness of the European industry in developing breakthrough technological solutions. Enhanced robustness and performance of sensor and data analysis systems and optimised HMI and advice strategies together with unobtrusive methods for measuring workload, distraction and fatigue. Improved efficiency, safety and traffic flow through better use of the existing infrastructure capacity, and reduction of emissions.

Type of action: Research and Innovation Actions
MG.3.6b-2015. Safe and connected automation in road transport

Relevant Forum Roadmap: City Logistics - High Capacity Transportation (HCT) Roads (Information Systems – Impact) - Connected and interoperable transports

Deadline: 27th August 2015

Specific Challenge: Automated and progressively autonomous driving applications in road transport, actively interacting with their intelligent environment could provide an answer to the EU objective of reconciling growing mobility needs with more efficient transport operations, lower environmental impacts and increased road safety.

Automation in road transport should make best use of the evolution of Cooperative ITS and the benefits made available by satellite navigation systems, such as the increased accuracy and robustness. Connectivity and cooperative mobility will be the key driving force for integrating automation into novel mobility concepts enabled by the European Wide Service Platforms (EWSP). Security and safety aspects of these systems are also crucial.

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Type of action: Coordination and Support Actions
MG-5.5a-2015. Demonstrating and testing innovative solutions for cleaner and better urban transport and mobility

Relevant Forum Roadmap: City Logistics - High Capacity Transportation (HCT) Roads - Connected and interoperable transports

Deadline: 31 March 2015

Specific Challenge: Many of Europe's urban areas are struggling to address the transport-related challenges they are facing. New technologies and innovative measures are emerging, but they are not taken up at a scale that is necessary to meet the targets of the Transport White Paper. Cities are hesitating to implement innovative solutions because little information is available on their effectiveness and on how to overcome the barriers to successful implementation. Special attention should be paid to issues related to vulnerable groups of citizens and gender issues.

Scope: The first part of the topic addresses Innovation Actions to be carried out by city-led consortia, composed of four to five cities, led by at least two advanced cities, which are committed to establish living laboratories where innovative solutions can be implemented. The participating cities should demonstrate their common interests and their vision on how they will ensure a meaningful and close cooperation. Proposals should outline how the work will support effectively the cities' efforts to follow a viable path towards sustainable mobility. Each city should follow an integrated approach by demonstrating and testing under real life-conditions a set of complementary and reinforcing mobility solutions. The solutions should combine newly-emerging technologies, policy-based, and soft measures with a strong replication potential. They should cover an appropriate sub-set of the eight ‘CIVITAS measure categories’: collective passenger transport; demand management strategies; mobility management and travel awareness; safety and security; urban freight logistics; information systems and services; and clean fuels and low emission vehicles; car-independent lifestyles. A thorough impact and process evaluation, on the basis of a common framework using a clear baseline in each city, will provide qualitative and quantitative information on the results of the local solutions implemented. The effectiveness of proposed measures in achieving local policy objectives should be evaluated and the barriers to broad deployment identified together with recommendations on how to overcome them. This should be accompanied by effective mechanisms for cross-fertilisation of knowledge and best-practises among the consortium members and beyond. Proposals may include preparatory, take up and replication actions, research activities, as well as tools to support local planning and policy making. A demonstrated contribution to the development or revision of Sustainable Urban Mobility Plans as well as furthering the Union’s strategy for international cooperation in research and innovation, especially with China, will be an advantage.

The Commission considers that proposals requesting a contribution from the EU of between EUR 12 to 18 million each for Innovation Actions would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Funding for major infrastructure works is not foreseen.

Expected impact: The Innovation Actions will produce added-value inputs to the development of European knowledge base on the effectiveness and impacts of innovative mobility solutions and approaches to their successful implementation.
Clear commitments and contribution from participants to Europe-wide take up during and beyond the project are expected.

Type of action: Innovation Actions
MG-5.5b-2015. Demonstrating and testing innovative solutions for cleaner and better urban transport and mobility

**Relevant Forum Roadmap: City Logistics - High Capacity Transportation (HCT) Roads - Connected and interoperable transports**

**Deadline: 27 August 2015**

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**Expected impact:** The Innovation Actions will produce added-value inputs to the development of European knowledge base on the effectiveness and impacts of innovative mobility solutions and approaches to their successful implementation.
Clear commitments and contribution from participants to Europe-wide take up during and beyond the project are expected.

*Type of action:* Innovation Actions
MG.6.3-2015. Common communication and navigation platforms for pan-European logistics applications

Relevant Forum Roadmap: City Logistics – Future Bus Systems - High Capacity Transportation (HCT) Roads - Transport/Traffic Control for different modes of traffic (Airways, Seaways, Railways, Roads) - on goods and passengers - Connected and interoperable transports

Deadline: 31st March 2015

Specific Challenge: Today, new international and intermodal repositories and data pipelines are being created, management systems are deployed and new data mining capabilities are being developed to deal with the data flood needed for logistics decision-making. Unfortunately, these data uses involve different information systems, different user requirements, different business models and different deployment trajectories. This constitutes an obstacle for the deployment of pan-European logistics solutions.

The challenge is to develop architectures and open systems for information sharing and valorisation, connecting key stakeholders with information and expertise enabling exploitation on the basis of trusted business agreements and with the relevant authorities (transport authorities and customs being the most eloquent player, but there are also other authorities in relation to health, safety, etc.). These architectures and systems need to accommodate feedback loops that allow for deviation management and corrective and preventive action (CAPA).

Scope: The work should focus on solutions to enable actors to take fast and well-informed decisions inside and cross-companies. This implies that information with the right quality, reliability and content is made available to concerned actors and shared between them even in difficult conditions such as ship-to-shore and ship-to-ship communication. The work will develop an open system and architecture that facilitates real time information exchange and co-operation between agents in the network. It will facilitate collaboration and give good confidence that a significant number of cases of horizontal shipper collaboration can be established within the horizon of the project and have a high expectation of continuance after the project ends.

Proposals should cover the development and integration of several or all of the following issues:
- Mobile communications for secured information exchange among actors (users, service providers, operators, communities) paying particular attention to the role of the driver and the vehicle as part of the vehicle to infrastructure architecture.
- Secure, resilient and trusted communications and information storage and processing including adequate information delivery infrastructures for future customs, other controlling authorities and international transport & trade.
- Provision of position and spatial information regarding goods on the move through European GNSS applications, RFID and 3G/4G (and future network development) services.
- Web-based open platforms to enable information exchange across suppliers, manufacturers, logistics providers and retailers without necessitating costly interfaces.
- Technical and organisational guidelines for data and information system governance, technical aspects of IT solutions, business models and processes.
- Deployment roadmaps for the application of collaborative systems and services—the legal and business outstanding aspects of such collaborations will be fully
assessed and recommendations made as to how to split the costs of collaboration and make it attractive for users to buy into the proposed collaborative system.

- Operational and business models that include the participation of SMEs in the voluntary sharing of data and participation in collaborative business services.

_The Commission considers that proposals requesting a contribution from the EU of between EUR 16 to 18 million each would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts._

*Expected impact*: Cloud-based data and services infrastructure, underpinned by common information models, will give all logistic stakeholders opportunities to collaborate on both an operational and strategic level. The creation of an architecture for logistics information sharing and valorisation will speed up the formation of a single logistics information space in Europe, that is accessible for the transport sector, its users and, in addition, public authorities. Once deployed, the platform for pan-European logistics application is expected to reduce energy consumption and thus greenhouse gas emissions of the supported supply chains by at least 30% compared to the current situation.

*Type of action*: Research and Innovation Actions
MG-8.3-2015. Facilitating market take up of innovative transport infrastructure solutions

**Relevant Forum Roadmap: City Logistics - Drivers of innovation on a liberalised rail market**

**Deadline: 27th August 2015**

**Specific Challenge:** The White Paper 'Towards a Single European Transport Area' aims at the completion of efficient, interoperable and integrated transport infrastructure network by 2050. These long term goals can only be achieved when infrastructure innovation, supported by targeted up-stream research activities, is deployed at integrated system level. However, testing and implementing solutions at system level is much more challenging than at component level in view of the number of technological and organisational parameters involved, their interdependency, the scale of investment and the potential impact on stakeholders. Although many technological solutions relative to transport infrastructure are already available for all transport modes, the challenge consists in overcoming highly fragmented demand. Decision-makers (mainly from the public sector) are often unaware of the availability and efficiency of highly innovative solutions and are not familiar with the use of public procurement for innovation.

**Scope:** Actions should lead to the improvement and capacity building in the field of public purchasing of innovative solutions in transport infrastructure leading to implementation of best available solutions on cross-border TEN-T network business cases representative of typical European situations. Proposals should be driven by clearly identified procurement needs of infrastructure owners (the procurers), including life-cycle and cost-benefit assessments and should effectively control budget across various European regions. The work should contribute to the revision/development of relevant standards and regulatory framework. Good practises should be made available for replication.

*The Commission considers that proposals requesting a contribution from the EU of between EUR 7 to 13 million each 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 selected actions are expected to:
- Serve as pilot projects to demonstrate the effectiveness of advanced technological solutions in reducing the total cost of ownership of transport and the effectiveness of new supply chain models and contractual arrangements.
- Allow for a better coordinated dialogue between procurers and suppliers contributing to long-lasting stakeholder partnerships with clearly defined roles and responsibilities.
- Contribute to competence building in the sector by enabling public procurers to improve their knowledge about available innovative solutions and leveraging the benefits of European cooperation in exchanging experience in procurement practices.
- Build a coherent basis for progressive step changes to regulation, standardization and public procurement practices fostering innovation and sustainability in transport infrastructure.

**Type of action:** Public Procurement of Innovative Solutions (PPI) Cofund
MG-8.4-2015. Smart governance, network resilience and streamlined delivery of infrastructure innovation

Relevant Forum Roadmap: High Capacity Transportation (HCT) Roads - Drivers of innovation on a liberalised rail market - Transport/Traffic Control for different modes of traffic (Airways, Seaways, Railways, Roads) - on goods and passengers - HCT Railways: Development of goods transports on Railways and combination transport - City Logistics - Goods transports in urban areas

Deadline: 31st March 2015

Specific Challenge: Infrastructure owners and operators need to ensure the best possible return from increasingly limited transport infrastructure investment funds. The main challenge is to overcome the lack of a common framework for governance, management and finance of transport infrastructure projects (including methodologies and modelling) with the aim to enable transparent, risk-based optimisation of investments within and across the modes. This includes issues such as resilience against climate change and other disturbances. Additionally, it is necessary to enhance the industry’s practices and capacities in order to raise the productivity, quality and timeliness of infrastructure projects.

Scope: Proposals should address one or several of the following aspects:
- Development of whole system planning environments (based e.g. on virtual design concepts) to support the streamlined delivery of infrastructure projects from concept to deployment. In this respect, the rail sector deserves particular attention.
- Innovative, harmonised and lean procurement processes, accompanied by adequate monitoring systems, contracting and tendering methods; management tools to provide help in innovation delivery.
- Solutions for advanced infrastructure capacity planning and modelling for all transport modes.
- Solutions for optimal cost-effectiveness, including network resilience, mapping of climate risk hot-spots, including under climate change, together with appropriate adaptation measures and cross-modal implementation strategies.
- Solutions for advanced asset management, advanced investment strategies and innovation governance, including smart monitoring systems (such as Structural Health Monitoring) and adequate indicators for cost and quality.

SME active participation is strongly encouraged.

The work will focus either on further advancements in knowledge where technological progress is still needed (Research and Innovation Actions), or on implementing innovative technologies in real life conditions via large scale demonstration actions (Innovation Actions). The need for strengthening the network between infrastructure owners and operators in view of enhancing the effectiveness of the sector could be approached through appropriate coordination schemes (Coordination and Support Actions).

Expected impact: Accelerated delivery of transport infrastructure through improved, transparent and harmonised investment decision making at a European level, balancing performance with cost (in terms of Total Cost of Ownership) and risk.
- Improved predictive capacity and maintenance planning of the European transport infrastructure network, including determination of the optimal balance between long-term renewal and short-term maintenance.
- Improved assessment of risks related to impacts of climate change and evaluation of possible measures of adaption.
- Faster adoption of innovation as a result of reinforced coordinated public-private partnerships, for example through (pre-competitive) innovation procurement procedures.
- Competence building in the area of transport infrastructure management, resulting in strong (public-sector) capabilities across the value chain of planning, delivery and operations.

_Type of action:_ 1) Research and Innovation Actions; 2) Innovation Actions; 3) Coordination and Support Actions.

Relevant Forum Roadmap: City Logistics - High Capacity Transportation (HCT)
Roads - Connected and interoperable transports

Deadline: 31st March 2015

Specific Challenge: A sound understanding of behavioural and societal factors – including economic, social, demographic, cultural and gender issues where relevant - that influence transport demand and supply is needed to ensure that, in shaping transport policies and research and innovation activities, the values, needs and expectations of the society are met.

Scope: A forum for communication, collaboration, relationship-building should develop multi-stakeholder interactions and produce an action plan for innovative solution/options for transport and mobility to advance the agenda of the transport sector and society at large. The work should be inclusive of the state of the art of ideas, trials and business endeavours on new mobility concepts. Stakeholders from within and outside the sector should be involved, in particular: policy makers, civil society organisations, end-users, industry including suppliers (vehicles and components – all modes) and transport service providers, academia and research organisations. These actors, by being engaged in this collaborative and knowledge-mobilisation process, will learn to explore together the most appropriate and viable solutions. Links and synergies with transport-related European Technology Platforms (ETPs) and the on-going TRANSFORUM project would add significant value. The action plan should focus on:
- Understanding user needs, mobility choices, aspirations and behaviours.
- Assessing how new mobility concepts would contribute to the overall transport efficiency.
- Exploring implications for policies, regulations, standards, forms of governance.
- Analysing societal resistance to acceptance of emerging transport technologies and services.
- Exploring market opportunities alongside the innovation chain, including services.
- Foster consensus-building and public-engagement, thus facilitating the dissemination of good practices and the deployment of innovative transport and mobility solutions.

In view of an appropriate potential impact, the Commission will positively evaluate proposals having a minimum duration of three years, partners coming from at least 10 different countries and from all the above-mentioned types of organisations. The maximum EU contribution cannot exceed EUR 3 million.

Expected impact: The setting up of this participatory framework is expected to:
- Ensure an inclusive approach in providing a comprehensive overview of new forms of mobility and transport, and their implications for users, the environment, society as a whole and policy makers.
- Enhance and better target transport policies and research and innovation priority setting.
- Address the mobility needs of specific groups and communities (accessibility; affordability, inclusiveness, safety, ageing population, etc.).
- Promote innovative/alternative business models and social innovation.
- Enhance corporate social and environmental responsibility.

Type of action: Coordination and Support Actions
NMP-17-2014. Post-lithium ion batteries for electric automotive applications

Relevant Forum Roadmap: City Logistics – Future Bus Systems

Deadline: 7th October 2014

Specific Challenge: The electrification of road transport is a key towards sustainable and environmentally friendly mobility of persons and transport of goods, in particular for short range transport and transport in urban areas. In order to reach this goal it is important to develop improved cost competitive and sustainable storage technologies for Electrified Vehicles (EV) achieving significantly improved performance with respect to current lithium-ion electrochemical storage technology, to allow the production of EVs that more closely match the performance of current internal combustion vehicles (e.g. and in particular considering the driving range).

Scope: To achieve progress well beyond current lithium-ion cell technologies, various key factors have to be improved at the same time, such as: energy density, power density, the ability to work under severe thermal conditions, charging speed, and inherent safety of the battery cells including crash and abuse conditions. And the ageing of the new chemistries has to be thoroughly understood and improved, in order to achieve a longer battery lifetime. In addition, the future battery has to have a competitive cost; it has also to be produced in an environmental friendly way, considering the availability of raw materials and the batteries' recycling potential, as well as a sound life cycle assessment. And the knowledge on production-technology and -capacity of cells, packs and systems should be made available. The scope may be reached e.g. by addressing new chemistries that allow high-energy densities, and by developing related specific new materials e.g. for cathodes and electrolytes. In order to accelerate the industrial take-up of the proposed solution, the development of prototypes should be included to show clear progress beyond existing post lithium-ion technology in terms of durability, cyclability and energy density, with consideration of scalability up to full scale for automotive applications.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 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: Significant improvements of the usability of EVs, with extended driving range and improved battery durability (recharging, cyclability and safety) obtainable at competitive costs. The energy density of the proposed new batteries should reach at least twice the energy density in comparison to the best in class Li-Ion technology at the same power density;
- Better acceptance of EV in society, and thus contribution to the improvements of sustainable transport, reducing pollution and noise in urban areas;
- European competitiveness through development of new key technology and related production capacities.

Type of action: Research and Innovation Actions
Other action - Europe wide open source transport models, technology watch, data and scenarios

Relevant Forum Roadmap: City Logistics – Future Bus Systems - Transport/Traffic Control for different modes of traffic (Airways, Seaways, Railways, Roads) - on goods and passengers

Specific Challenge: The challenge is to dispose of reliable and continuously updated information on the European transport system, to integrate the collected information in appropriate transport system models and to develop alternative medium-long term scenarios for the next 50 years.

Scope: The proposals should aim at developing new transport system models and associated databases, as well as alternative scenarios for the next 50 years. The selected proposal will set up a platform for permanent data acquisition and sharing, and will thus make available an extensive amount of information for the use of researchers, scholars, businesses, service operators, public authorities and policy makers. It should also contemplate the organisation model and the legal framework for governing, maintaining and exploiting the platform on a continuous and open basis. It should address the following core activities:

- **Models:**
  - Development of a new, integrated transport system model, of the freight and passenger networks covering all modes of transport as well as multimodal transport at the most detailed geographical level possible. To create synergies the model and the associated database will be developed in parallel.

- **Database:**
  - Definition of the data needed, analysis of the data available, either from private or public sources, and identification of the gaps in the data collection. The publicly available European Transport policy Information System (ETIS plus) data warehouse should be exploited and possibly built upon.
  - Development of viable procedures for the acquisition, quality control, validation, elaboration, regular update and public accessibility of data. Innovative ways of data collection characterised by low administrative burden should be pursued.
  - Europe-wide surveys to ascertain mobility patterns and user expectations.

- **Technology and innovation watch for the new transport technologies, innovative mobility solutions and emerging socio-economic trends for incorporation in modelling activities and scenario development.**

- **Scenarios:**
  - Integrated medium-long term scenario development to better underpins policymaking.

**Indicative budget:** **EUR 5.00 million from the 2015 budget.**

**Expected impact:** The project will significantly improve the understanding of European transport and mobility patterns, trends and needs; will provide a solid empirical basis for decision making at European, national and regional level; and will thus ultimately contribute to making the transport system more efficient and user friendly.

**Type of action:** Public procurement, open tender
IT-1-2014-1. Small business innovation research for Transport

Relevant Forum Roadmap: All roadmaps

Deadline: 17th December 2014

Specific Challenge: The European transport sector must have the capacity to deliver the best products and services, in a time and cost efficient manner, in order to preserve its leadership and create new jobs, as well as to tackle the environmental and mobility defies. The role of SMEs to meet these challenges is critical as they are key players in the supply chains. Enhancing the involvement of weaker players in innovation activities as well as facilitating the start-up and emergence of new high-tech SMEs is of paramount importance.

Scope: The SME instrument consists of three separate phases and a coaching and mentoring service for beneficiaries. Participants can apply to phase 1 with a view to applying to phase 2 at a later date, or directly to phase 2. In phase 1, a feasibility study shall be developed verifying the technological/practical as well as economic viability of an innovation idea/concept with considerable novelty to the industry sector in which it is presented (new products, processes, design, services and technologies or new market applications of existing technologies). The activities could, for example, comprise risk assessment, market study, user involvement, Intellectual Property (IP) management, innovation strategy development, partner search, feasibility of concept and the like to establish a solid high-potential innovation project aligned to the enterprise strategy and with a European dimension. Bottlenecks in the ability to increase profitability of the enterprise through innovation shall be detected and analysed during phase 1 and addressed during phase 2 to increase the return in investment in innovation activities. The proposal should contain an initial business plan based on the proposed idea/concept. The proposal should give the specifications of the elaborated business plan, which is to be the outcome of the project and the criteria for success. Funding will be provided in the form of a lump sum of EUR 50,000. Projects should last around 6 months. In phase 2, innovation projects will be supported that address any area of the Transport Specific Programme (H2020 Specific Programme: Part III – 4. Smart, green and integrated transport), and that demonstrate high potential in terms of company competitiveness and growth underpinned by a strategic business plan. Activities should focus on innovation activities such as demonstration, testing, prototyping, piloting, scaling-up, miniaturisation, design, market replication and the like aiming to bring an innovation idea (product, process, service etc.) to industrial readiness and maturity for market introduction, but may also include some research. For technological innovation a Technology Readiness Levels of 6 or above (or similar for non-technological innovations) are envisaged; please see part G of the General Annexes. Proposals shall be based on an elaborated business plan either developed through phase 1 or another means. Particular attention must be paid to IP protection and ownership; applicants will have to present convincing measures to ensure the possibility of commercial exploitation (‘freedom to operate’). Proposals shall contain a specification for the outcome of the project, including a first commercialisation plan, and criteria for success.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 2.5 million would allow phase 2 to be addressed appropriately. Projects should last between 12 and 24 months.
In addition, in phase 3, SMEs can benefit from indirect support measures and services as well as access to the financial facilities supported under Access to Risk Finance of this work programme.

Successful beneficiaries will be offered coaching and mentoring support during phase 1 and phase 2. This service will be accessible via the Enterprise Europe Network and delivered by a dedicated coach through consultation and signposting to the beneficiaries. The coaches will be recruited from a central database managed by the Commission and have all fulfilled stringent criteria with regards to business experience and competencies. Throughout the three phases of the instrument, the Network will complement the coaching support by providing access to its innovation and internationalisation service offering. This could include, for example, depending on the need of the SME, support in identifying growth potential, developing a growth plan and maximising it through internationalisation; strengthening the leadership and management skills of individuals in the senior management team and developing in-house coaching capacity; developing a marketing strategy or raising external finance.

Expected impact: Enhancing profitability and growth performance of SMEs by combining and transferring new and existing knowledge into innovative, disruptive and competitive solutions seizing European and global business opportunities. Market uptake and distribution of innovations tackling the specific challenges of the Transport Specific Programme in a sustainable way. Increase of private investment in innovation, notably leverage of private co-investor and/or follow-up investments. The expected impact should be clearly described in qualitative and quantitative terms (e.g. on turnover, employment, market seize, IP management, sales, return on investment and profit).

Types of action: SME Instrument (70%)
IT-1-2015-1. Small business innovation research for Transport

Relevant Forum Roadmap: All roadmaps

Deadline: 16 December 2015

**Specific Challenge:** The European transport sector must have the capacity to deliver the best products and services, in a time and cost efficient manner, in order to preserve its leadership and create new jobs, as well as to tackle the environmental and mobility defies. The role of SMEs to meet these challenges is critical as they are key players in the supply chains. Enhancing the involvement of weaker players in innovation activities as well as facilitating the start-up and emergence of new high-tech SMEs is of paramount importance.

**Scope:** The SME instrument consists of three separate phases and a coaching and mentoring service for beneficiaries. Participants can apply to phase 1 with a view to applying to phase 2 at a later date, or directly to phase 2.

**In phase 1,** a feasibility study shall be developed verifying the technological/practical as well as economic viability of an innovation idea/concept with considerable novelty to the industry sector in which it is presented (new products, processes, design, services and technologies or new market applications of existing technologies). The activities could, for example, comprise risk assessment, market study, user involvement, Intellectual Property (IP) management, innovation strategy development, partner search, feasibility of concept and the like to establish a solid high-potential innovation project aligned to the enterprise strategy and with a European dimension. Bottlenecks in the ability to increase profitability of the enterprise through innovation shall be detected and analysed during phase 1 and addressed during phase 2 to increase the return in investment in innovation activities. The proposal should contain an initial business plan based on the proposed idea/concept.

The proposal should give the specifications of the elaborated business plan, which is to be the outcome of the project and the criteria for success.

Funding will be provided in the form of a lump sum of EUR 50.000. Projects should last around 6 months.

**In phase 2,** innovation projects will be supported that address any area of the Transport Specific Programme (H2020 Specific Programme: Part III – 4. Smart, green and integrated transport), and that demonstrate high potential in terms of company competitiveness and growth underpinned by a strategic business plan. Activities should focus on innovation activities such as demonstration, testing, prototyping, piloting, scaling-up, miniaturisation, design, market replication and the like aiming to bring an innovation idea (product, process, service etc.) to industrial readiness and maturity for market introduction, but may also include some research. For technological innovation a Technology Readiness Levels of 6 or above (or similar for non-technological innovations) are envisaged; please see part G of the General Annexes.

Proposals shall be based on an elaborated business plan either developed through phase 1 or another means. Particular attention must be paid to IP protection and ownership; applicants will have to present convincing measures to ensure the possibility of commercial exploitation ('freedom to operate').

Proposals shall contain a specification for the outcome of the project, including a first commercialisation plan, and criteria for success.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 2.5 million would allow phase 2 to be addressed appropriately. Projects should last between 12 and 24 months.
In addition, in phase 3, SMEs can benefit from indirect support measures and services as well as access to the financial facilities supported under Access to Risk Finance of this work programme.

Successful beneficiaries will be offered coaching and mentoring support during phase 1 and phase 2. This service will be accessible via the Enterprise Europe Network and delivered by a dedicated coach through consultation and signposting to the beneficiaries. The coaches will be recruited from a central database managed by the Commission and have all fulfilled stringent criteria with regards to business experience and competencies. Throughout the three phases of the instrument, the Network will complement the coaching support by providing access to its innovation and internationalisation service offering. This could include, for example, depending on the need of the SME, support in identifying growth potential, developing a growth plan and maximising it through internationalisation; strengthening the leadership and management skills of individuals in the senior management team and developing in-house coaching capacity; developing a marketing strategy or raising external finance.

**Expected impact:** Enhancing profitability and growth performance of SMEs by combining and transferring new and existing knowledge into innovative, disruptive and competitive solutions seizing European and global business opportunities. Market uptake and distribution of innovations tackling the specific challenges of the Transport Specific Programme in a sustainable way. Increase of private investment in innovation, notably leverage of private co-investor and/or follow-up investments. The expected impact should be clearly described in qualitative and quantitative terms (e.g. on turnover, employment, market seize, IP management, sales, return on investment and profit).

**Types of action:** SME Instrument (70%)
LCE-11-2015. Developing next generation technologies for biofuels and sustainable alternative fuels

Relevant Forum Roadmap: Sustainable Fuels for transportation in Sweden - Connected and interoperable transports

Deadline: 3d September 2014

Specific challenge: Europe has limited biomass and land resources to cope with an increased demand for fuels and other uses. Thus, in the long-term perspective, new technologies of sustainable biofuels and alternative fuels need to be developed that radically improve the state-of-art, notably in regards to the following sub-challenges:

a) Improving conversion efficiency and/or enlargement of the biomass feedstock basis.
b) Developing alternative fuels through use of new and sustainable resources from non-biomass non-fossil sources.
c) Improving the economic, environmental and social benefits relative to fossil fuels and currently available biofuels, notably regarding cost reduction, minimisation of demand on natural resources (land and water in particular), enhanced energy balance, reduced GHG emissions (including carbon stock changes) and development of rural areas.

Scope: Proposals focusing on the long-term perspective should aim at developing the next wave of alternative and sustainable fuels by moving technologies from TRL 3-4 or to TRL 4-5 (please see part G of the General Annexes). In each case, they should address the c) sub-challenge described above. Environment, health and safety issues, regional and social dimension, shall be considered in all developments and appropriately addressed. An assessment of alternative uses of the used feedstocks outside the bioenergy sector should also be done. Biofuels produced from starch, sugar and oil fractions of food/feed crops are excluded. An important element will be an increased understanding of risks (whether technological, in business processes, for particular business cases, or otherwise in each area), risk ownership, and possible risk mitigation. Proposals shall therefore include appropriate work packages on this matter. Proposals shall explicitly address performance and cost targets together with relevant performance indicators, expected impacts, as well as provide explicit exploitation plans.

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 6 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 new developed technology pathways should permit the use of new feedstock sources that do not compete directly or indirectly with food or feed production for resources, or a more efficient conversion of the current ones. A favourable energy balance is expected, as well as a significant potential for cost reduction, which would permit these fuels to eventually compete favourably with fossil or older-generation equivalent fuels. The development of new technologies will permit robust and reliable assessment of the environmental and social benefits with respect to current technologies, notably in terms of GHG performance, energy balance,
efficient use of natural resources, decentralised energy production, and job creation in rural areas, as well as secure and affordable energy supply in Europe or worldwide. **Type of action:** Research & Innovation Actions
LCE-12-2015 Demonstrating advanced biofuel technologies

Relevant Forum Roadmap: City Logistics - Sustainable Fuels for transportation in Sweden - Connected and interoperable transports

Deadline: 3d March 2014

Specific challenge: In the short-term and medium-term perspective, due to different issues (such as the limited distribution infrastructure of the electrification option, or the unsuitability of such option for certain transport modes), biofuels are expected to be increasing contributors to the de-carbonisation of the transport sector. In order to achieve the EU targets regarding renewable energy in transport and CO2 abatement (set out in the RES and Fuel Quality Directives), and to address concerns regarding indirect and direct environmental impacts of biofuels, new and advanced biofuels using sustainable feedstock need to reach the market. To this end, the following sub-challenges should be addressed:

- Proving that advanced biofuels and bioenergy carriers technologies, as identified in the Implementation Plan of the European Industrial Bioenergy Initiative (EIBI)[1], are technically viable, environmentally and socially sustainable, and potentially cost-competitive at commercial scale.
- Developing logistic systems for a sound, safe and sustainable feedstock supply.

Scope: Proposals should address the medium-term challenges for market penetration of advanced biofuels as presented above. In each case, they should address one of the respective sub-challenges, or a combination of them.

Environment, health and safety issues in the whole life cycle should be considered in all demonstrations and appropriately addressed. An assessment of alternative uses of the used feedstocks outside the bioenergy sector should also be done.

Biofuels produced from starch, sugar and oil fractions of food/feed crops are excluded.

An important element for the entire area of renewables will be an increased understanding of risks (whether technological, in business processes, for particular business cases, or otherwise in each area), risk ownership, and possible risk mitigation. Proposals shall therefore include appropriate work packages on this matter.

Proposals shall explicitly address performance and cost targets together with relevant key performance indicators and the expected impacts. Industrial involvement in the consortium and explicit exploitation plans are a prerequisite.

All proposals have to include a work package on the business case of the technology solution being addressed. This work package has to demonstrate the business case of the technology and identify potential issues of public acceptance, market and regulatory barriers, including standardisation needs. It should also address, where appropriate, synergies between new and existing technologies, regional approaches and other socio-economic and environmental aspects from a life-cycle perspective.

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 20 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: Testing advanced biofuel technologies at large industrial scale reduces the technological risks, paving the way for subsequent first-of-a-kind, commercial-scale industrial demonstration projects. For this purpose, the scale of the proposals should permit obtaining the data and experience required so that a first-of-
a-kind, commercial-scale industrial demonstration project can be envisaged as a next step. The industrial concepts demonstrated should have the potential for a significant social and economic impact, notably in terms of job creation, economic growth and safe and affordable energy supply in Europe and beyond.

*Type of action:* Innovation Actions
LCE-13-2015 Partnering with Brazil on advanced biofuels

Relevant Forum Roadmap: City Logistics - Sustainable Fuels for transportation in Sweden - Connected and interoperable transports

Deadline: 5th May 2015

Specific challenge: Decarbonising the transport sector is a major challenge in the global fight against climate change. As such, it is a crucial element in the EU Energy Roadmap 2050 and in the Brazilian National Policy for Climate Change. In the short-term and medium-term perspective, biofuels are expected to be the main contributors to this de-carbonisation. In order to achieve the EU and Brazil policy targets in this domain, and to address concerns regarding environmental impacts of biofuels, new and advanced biofuels using sustainable feedstock need to reach the market.

Brazil is an essential partner in this sector: it has outstanding expertise, a well-established and highly competitive first-generation industry, as well as optimal conditions for the development of an advanced biofuel industry.

Hence in the framework of the EU-Brazil S&T Cooperation Agreement, the European Commission representing the European Union and the Ministry of Science, Technology and Innovation (MCTI) of the Government of Brazil are working together to benefit from the complementarities in research and innovation, in order to foster the development of advanced biofuels and accelerate their commercialisation both in Brazil and in Europe.

The advanced biofuel technologies to reach first commercial maturity will most likely be linked to and find its basis on the current production systems with high economic and environmental performance, such as the sugarcane based ethanol. The joint work should thus focus on the development of advanced biofuel technologies that can be integrated in existing sugarcane-based biofuel processes.

To this end, the following sub-challenges should be addressed:

• Exploiting synergies between Brazil and Europe in terms of scientific expertise, industrial capacity and resources.

• Proving that the integration of advanced biofuels technologies into existing sugarcane ethanol plants is technically feasible, cost competitive and environmentally and socio-economically sustainable at commercial scale. Joint work should build upon the Brazilian sugarcane ethanol model, and benefit from the Brazilian and European experience in biofuels.

• Developing or improving logistic systems for a sound and sustainable feedstock supply.

Scope: Proposals should address the first sub-challenge presented above, and at least one of the other two. They should bring technology solutions to a higher TRL level. Proposals should aim at moving technologies that reached already TRL 4-6 to TRL 5-7 (please see part G of the General Annexes) through industrial demonstration projects, which may include supporting R&D activities if needed. Biofuels produced from starch, sugar and oil fractions of food/feed crops are excluded.

All proposals have to include a work package on ‘the business case’ of the technology solution being addressed. That work package has to demonstrate the business case of the technology and identify potential issues of public acceptance, market and regulatory barriers, including standardisation needs. It should also address, where appropriate, synergies between new and existing technologies, regional approaches and other socio-economic and environmental aspects from a life-cycle perspective. An assessment of alternative uses of the used feedstocks outside the bioenergy sector should also be done.
The exploitation of results, including IPR, should be appropriately addressed in the proposals. This involves, *inter alia*, ensuring a balanced role of Brazilian and European partners in such exploitation.

*The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 10 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:* Testing advanced biofuel technologies at pre-commercial industrial scale reduces the technological risks, paving the way for a subsequent market replication. For this purpose, the scale of the projects should permit obtaining the data and experience required so that a first-of-a-kind, commercial-scale industrial project can be envisaged as a next step. The industrial concepts demonstrated should have the potential for a significant social and economic impact, notably in terms of job opportunities and wealth creation in rural areas of Brazil or Europe. Clearly positive environmental impact should also be obtained.

*Type of action:* Innovation Actions
LCE 14 – 2015 - Market uptake of existing and emerging sustainable bioenergy

Relevant Forum Roadmap: Sustainable Fuels for transportation in Sweden

Deadline: 3d March 2015

Specific challenge: Actions are still needed to foster the development of the bioenergy sector and to ensure its sustainability. One way to do it is to use more and sustainable bioenergy. However, the EU needs to expand the supply of bioenergy produced in the EU, by encouraging the EU farmers and foresters to produce also energy and energy intermediaries.

In the short- and medium-term perspective, sustainable bioenergy in all its forms is expected to be the main contributor to the de-carbonisation. In order to achieve the EU targets set out in the RES and Fuel Quality Directives, and to address concerns regarding indirect and direct environmental impacts, sustainable bioenergy technologies (both existing and emerging) need to further penetrate the market.

Scope: Proposals should address one or several of the following bullet points using technologies and systems, which are already at TRL 7-9 (please see part G of the General Annexes):

- Setting up or strengthening sustainable local bioenergy supply chains that meet highest environmental criteria and quality standards, including consideration for indirect impacts and energy balances;
- Ensuring development and / or implementation of quality and sustainability standards for bioenergy in all its forms;
- Creating a market for sustainable intermediate bioenergy carriers to enable better technology competitiveness through economies of scale;
- Encouraging European farmers and foresters to produce non-food bioenergy or bioenergy carriers alongside food, feed and other products.
- Development of methodologies for the traceability of biomass feedstocks from which bioenergy is produced (e.g. to distinguish first-generation from advanced biofuels);
- Removing non-technical barriers to widespread production and use of biogas/biomethane from manure and other wastes as one of the most sustainable fuels available today for use in transport and for incorporation into the grid;
- Ensuring sustained public acceptance of sustainable advanced biofuels;
- Exchange of information on best practices for bioenergy policy, regulations and support schemes to allow the most sustainable and energy efficient use of bio-resources.
- Cooperation between different policy areas at national / regional level (e.g. energy, agriculture, environment, waste, transport, etc.) needs to be increased to optimise the regulatory framework and implementing measures for the bioeconomy through exchange of information and best practices;
- All Member States must possess the necessary capacity to enact the EU legislation, while the businesses must make full use of the opportunities that these new markets create for them. Therefore specific capacity building activities targeting the main stakeholders (e.g. biomass suppliers and users, decision makers, financial institutions, auditors and verification bodies) are needed.
- Tailored financing schemes for supporting investments in innovative and established bioenergy technologies must be implemented, and the most successful schemes replicated.

Regional specificities, socio-economic and environmental aspects from a life-cycle perspective shall be considered.
The Commission considers that proposals requesting a contribution from the EU of between EUR 1 to 2 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:** Increasing the share of sustainable bioenergy in the final energy consumption.
Substantial and measurable reductions in the transaction costs for project developers as well as for the permitting authorities, whilst still fully addressing the needs for environmental impact assessments, including considerations for indirect impacts and energy balance, and public engagement.
Development of better policy, market support and financial frameworks, notably at national, regional and local level.

**Type of action:** Coordination and Support Actions
LCE-17-2015 Highly flexible and efficient fossil fuel power plants

Relevant Forum Roadmap: Sustainable Fuels for transportation in Sweden

Deadline: 3d September 2015

Specific challenge: The share of energy produced from renewable resources is growing rapidly. The output of wind and solar power is highly variable, and depends of factors such as weather conditions and time of day. With this growing share of renewable power, in particular when having priority access to the grid, fossil fuel power plants will have to increasingly shift their role from providing base-load power to providing fluctuating back-up power to meet unpredictable and short-noticed demand peaks, in order to control and stabilise the grid. Plants should be able to run both at the lowest part load possible at the highest possible efficiency. Moreover, plants will be required to operate across the entire load range with high load-change velocities, and even operate in start/stop mode with full turndown and very fast re-start, all at minimal fuel consumption. This forces base-load plants to operate closer to their design limits and through significantly more thermal cycles, leading to increased rate of wear on plant components. Operational flexibility therefore presents a significant challenge for fossil fuel power (and CHP) plants.

Scope: Focus on progressing solutions that already reached TRL 3 to TRL 4-6 (please see part G of the General Annexes) and offer the highest potential for full integration into an energy system with ever higher shares of renewable energies. Solutions with lowest greenhouse gas emissions per energy unit are preferred. Collaboration with power plant operators and Transmission System Operators (TSOs) is strongly encouraged.

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 6 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 should lead to new and cost-effective solutions for highly flexible new and existing fossil fuel power plants (including those using dispatchable renewable fuels), capable of meeting demand peaks and renewable output reductions, at minimal fuel consumption and emissions, while mitigating the effects of cycling operation to avoid excessive service life expenditure, and not impeding the potential CO2 capture readiness of the power plants.

Type of action: Research and Innovation Actions
GV-6-2015 Green vehicles: Powertrain control for heavy-duty vehicles with optimised emission

**Relevant Forum Roadmap:** Electrification of road transport, Green train

**Deadline:** 27th August 2015

**Specific challenge:** Reducing real driving emissions and consumption of heavy-duty road haulage is one of the main societal challenges for the sector. Fuel efficiency and emissions reduction are sometimes dependent on how they interact with each other and with the specific vehicle application and operating conditions. The challenge is therefore to develop new means of flexible and global engine and emissions control in an optimal way for each application in order to maximise the potential utilisation of the individual systems.

**Scope:** Proposals should focus on methods how to optimise the control of powertrains taking into account specific transportation tasks. This can be achieved by using the information provided by new generation navigation systems and emission sensors linked to the On Board Diagnosis/On Board Measuring system in combination with electronics and actuators. The strategy will use data such as transport assignment (total weight, vehicle configuration, etc.), traffic and weather conditions, topography and road network on the chosen route, driving patterns of the surrounding vehicles, the state of the combustion engine, after treatment and transmission, monitored emissions emitted, etc. The resulting technology should deliver a global optimum for consumption (for both fuel, electric energy and other consumables related to emission control such as urea or ammonia) and noxious emissions on each mission, to be validated through a demonstrator.

*The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 7 million each would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.*

**Expected impact:** A reduction of fuel consumption of at least 20% on the same vehicle with conventional control should be demonstrated comparatively, while not exceeding Real Driving Emissions limits set by the established Euro VI procedures.

**Type of action:** Innovation Actions
GV-8-2015 - Electric vehicles’ enhanced performance and integration into the transport system and the grid

Relevant Forum Roadmap: Electrification of road transport

Deadline: 27th august 2015

Specific challenge: The limited driving range of electric vehicles is one of the biggest deployment challenges for electro mobility. A ground-up re-design is needed to fully take advantage of the design freedoms and the opportunities in defining and developing the electric and electronic architecture and components. This should result in increased efficiency and range and make a major contribution towards the transition to fully electric vehicles (FEV's).

A particularly important element that needs to be addressed is the battery management system (BMS), which is fundamental for many aspects of electrified vehicle performance, from energy efficiency (and therefore range) to safety, battery life and reliability.

Information and communication technologies (ICT) significantly contribute to enhancing the energy efficiency and thus the range of the vehicle by providing accurate prediction of the range and offering personalised options and services to the driver. Furthermore ICT supports recharging that is coordinated with the local electric grid capabilities. Such coordination must accommodate not only passenger EVs, but also meet the requirements of electric buses, vans or trucks, which are expected to require high-powered fast recharging.

Scope: Proposals should address one of the following complementing domains and could include interfaces between these domains: EV concepts featuring a complete revision of the electric and electronic architecture to reduce complexity and the number of components and interconnections, whilst improving energy efficiency, functionality and modularity. This may be supported by drive-by-wire or wireless communication, as well as advanced energy storage, transmission and conversion systems including miniaturisation. Challenges in safety, security, reliability and robustness, including electro-magnetic compatibility, are to be addressed. Work shall pursue a high degree of standardisation and cover the entire electric vehicle value chain.

Concerning BMS research work will focus on a combination of the following aspects:

- Novel BMS designs with improved thermal management, power density and lifetime, safety and reliability.
- Improved modelling and simulation tools for BMS improvement.
- Contribution to standardisation of BMS components and interfaces.
- Test methodologies and procedures to evaluate the functional safety, reliability and lifetime of battery systems.
- In-vehicle integration of the overall cycle of EV energy management into a comprehensive EV battery and ICT-based re-charging system management, providing ergonomic and seamless user support. Such integration should build upon existing technology standards.
- Digital support for EVs such as common information model, market place interaction and service provision based on wireless / power line communication interfaces, roaming management, energy consumption and supply as well as cost aspects are in the scope.
- Interoperability of EVs with the communication infrastructure and electricity grid regarding locally deployed smart-grid and smart-metering systems while investigating arising operational issues and taking current developments into
The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 10 million each would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected impact:**
- Improvements in the cost-performance ratio of EV contributing to quicker market take-up.
- Enhancements to vehicle range and/or weight, battery life and reliability without compromising on safety - delivering a more robust and well managed battery system.
- Standardised BMS components and interfaces
- Progress on ICT-based technologies for coordinated EV recharging.
- Improved attractiveness of EVs, achieved through a seamless and ergonomic energy management cycle (spanning the entire cycle from re-charging spot selection/reservation to plug-out after re-charging).
- Contributions to standardisation strengthening the competitiveness of the European industry.

**Type of action:** Research and Innovation Actions
DRS-12-2015 Critical Infrastructure “smart grid” protection and resilience under “smart meters” threats

Relevant Forum Roadmap: Electrification of road transport

Deadline: 27th August 2015

Specific Challenge:
Critical Infrastructure functions are technologically and operationally interconnected, of which their exact possibilities and potential risks need to be better understood. For example: in the case of energy distribution networks, especially “smart grids”, the massive proliferation of “Smart Meters” as mandated by the Third energy package introduces new threats. The same is applicable to all utility supply networks (e.g. water or gas system supply). The systems and meters of the charge points for electrical cars should be also a concern, specially considering the increasing market for this type of vehicles.

Scope: The objective is to analyse potential new threats generated by the massive introduction of “smart meters” on the distribution grid system and propose concrete solutions in order to mitigate the risks, improve resilience and reduce vulnerability of critical infrastructure “smart grid”, due for example to cyber attacks, or to the locally diffused interconnectivity with renewable energy grids, and the existence of widely spread entry points that could locally influence the energy grid and its functioning.

The new technologies, processes, methods and dedicated capabilities shall be developed, which shall also take into account the urban areas implications (i.e. the general public subscribing to this service). The proposal shall provide concrete solutions for securing public and private critical networked infrastructures and services against the above-mentioned threats.

A key characteristic of the Smart Grid is that it consists of millions of devices, spread across organizations and households in a vast geographical area. In case of a Public Key Infrastructure (PKI) usage, a utility company would face an extreme credential management overhead and logistic costs of maintenance. This means that new security management schemes must be designed and evaluated for the Smart Grid to meet its high scalability requirements. Security solutions must take into account that an adversary has a physical access to smart meters. These devices’ cost, power, memory, and computational limitations restrict the ability to deploy standard trusted platform modules on them. Due to the fact that smart meters will be deployed for many years, novel cryptographic solutions should be tested that include message encryption, authentication and integrity, along with the highest possible levels of efficiency in time critical and high volume data.

It is expected that consortia under this research topic will select the most representative sample of “smart meters” used in Europe’s smart grid as starting point of the research and analyse their potential weakness/threats.

Moreover the proposal shall study and provide solutions in order mitigate the impact of “smart meters” on the current critical infrastructure security and resilience to new threats.

It should take into consideration the work completed to date by the the Smart Grid Task Force Working Group 2, concerning the cyber security assessment framework and the related Best Available Techniques there defined.

Finally the research should be carried out in the context of policy initiatives at EU level on the Smart Meters and Smart Grids, such as the 2011 CEN/CENELEC/ETSI Mandate 490 on smart grids (including the security and data privacy issues on the roll-out of smart metering systems), and the 2009 CEN/CENELEC/ETSI Mandate 441
on smart meters, as well as the guidance on software in smart meters, provided by WELMEC. Proposals addressing this topic may involve the use of classified background information (EU or national) or the production of security sensitive results. As such, certain project deliverables may require security classification. The final decision on the classification of projects is subject to the security evaluation.

The Commission considers that proposals requesting a contribution from the EU of between €2m and €5m would allow this specific challenge to be addressed appropriately (similar to the FP7 Capability Projects described in the general introduction). Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact:
- Higher protection levels of energy distribution grid infrastructures
- More effective and systematic approach to resilience enhancements of smart grid critical infrastructures when new components are added
- Improved applicability through small-scale proof of concept of system to demonstrate the “Resilience” of the proposed “system”
- Increased understanding of technology providers on modern operational requirements thus increasing their competitiveness.

Type of action: Research & Innovation Actions
SCC-01-2015. Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse (large scale demonstration - first of the kind) projects

Relevant Forum Roadmap: All roadmaps
Deadline: 3d March 2015

Specific Challenge: The EU policy and regulatory framework in the sectors of energy, transport and ICT supports the development of sectoral solutions, i.e. solutions with a limited degree of integration. However, for successful and accelerated implementation in real environments such as urban ones - that also have to take into account local specificities the test of integrated measures will pave the way for faster market roll-out of technologies. The key challenges for Smart Cities and Communities are to significantly increase the overall energy efficiency of cities, to exploit better the local resource both in terms of energy supply as well as through the demand side measures. This will imply the use of energy efficiency measures optimizing at the level of districts, the use of renewables, the sustainability of urban transport and the needed drastic reduction of greenhouse gas emissions in urban areas - within economically acceptable conditions - while ensuring for citizens better life conditions: lower energy bills, swifter transport, job creation and as a consequence a higher degree of resilience to climate impacts (e.g. urban heat islands effects) etc.

Scope: To identify, develop and deploy replicable, balanced and integrated solutions in the energy, transport, and ICT actions through partnerships between municipalities and industries.
These solutions at the intersection of the three sectors will have a holistic approach and are still facing first mover risk. These will be the lighthouse projects as identified by the Communication on Smart Cities and Communities. Lighthouse projects will target primarily large-scale demonstration of replicable SCC concepts in city context where existing technologies or very near to market technologies (TRL 7 and more, see part G of the General Annexes) will be integrated in an innovative way. The proposals should address the following main areas:
- (Nearly zero) or low energy districts: through the integration and management of: i) the supply of energy with predominant exploitation of local resources (e.g. waste heat, renewables, storage) and the active participation of consumers (e.g. use of aggregators); ii) the cost-effective refurbishment of existing buildings without significant disruption for tenants (use of sustainable materials) with a special focus on residential buildings iii) the cross-cutting ICT solutions for the design and overall management of energy/ transport systems
- Integrated Infrastructures: through the integration of physical infrastructures such as core networks, street scenes, lighting, industrial sites etc to create new forms of value through re-use and repurposing. This should lead to quantifiable benefits such as reduction of capital /operational expenditure as well as reduced carbon / energy footprints. This might also imply exploitation of synergies between requirements for smart grids, broadband infrastructures and in general poly networks (eg district heating and cooling).
- Sustainable urban mobility: through the integration of energy/ fuelling infrastructure with vehicle fleets powered by alternative energy carriers for public and private transport, including logistics and freight-distribution. Implications on energy management, and in the case of electro mobility, the impact on the electricity grid, of the deployment of high numbers of vehicles and/or the alternative fuel blends performance must be assessed.
The proposed proposals should address in addition to the main areas presented above a strategy that addresses appropriate enabler actions to support the commercial exploitation of the proposal. This includes (indicative list): commitment of authorities (even if changes of politicians/ majority, in the course of the project); citizens’ engagement and empowerment; optimizing policy and regulatory frameworks; open, consistent data and performance measurements; dissemination and unlocking the market potentials worldwide.

According to the Communication on Smart Cities and Communities the light house projects should look for creating partnerships between industries, academics and cities, empower citizens and ensure the replicability of the solutions, ensure the funding from various sources. Therefore each project should:

- Be realized in 2 – 3 cities or communities (light house cities or communities);
- Include industry, city planning authorities which should also reflect the view of the consumer organizations, research community, local Small and Medium Size Companies (SMEs);
- In addition each project should co-involve 2 - 3 follower cities i.e. cities willing to contribute to the process though the replication of solutions at the end of the project and having access to the knowhow and results of the project and a privileged contact with the project’s partners. The involvement of the follower cities should be relevant (e.g. participating in definition of user requirements and methodology of transferability of solutions, data collection etc.). The follower cities should aim at improving their energy performance or the share of use of renewables (e.g. 60% reduction of primary energy for buildings, 20 - 30 % RES use for electricity as well as for heating and cooling). EU geographical coverage conditions should be also applied.
- Ensure that all proposed activities are a part of ambitious urban plan. These activities should also lead to the development of integrated urban plans. For the lighthouse cities or communities these plans should be finalized (e.g. those compiled for the Covenant of Mayors, Sustainable Energy Action Plans, plans committed under the Green Digital Charter etc., but without limiting to this list of initiatives). The urban plan shall integrate buildings planning, energy networks, ICT, transport/mobility planning; additional issues may be addressed as well if relevant for the city. These plans shall be submitted with the proposal as a supporting document(s).
- In order to ensure the success of the lighthouse projects, the funding for the other parts of the programme or initiative in which the lighthouse projects are embedded should be secured from other sources, preferably private ones, but also other EU funding sources (European Structural and Investment (ESI) funds for example), national or regional funding.
- Projects should demonstrate and validate attractive business plans that allow large scale replication of fast economic recovery in cities of varying degrees of economic conditions (from very poor to very rich), varying sizes but significant urban areas and varying climatic conditions to ensure high impact and replication potential.
- The industrial partners and municipality authorities should engage in replicating successful demonstration in their own and other cities, notably ‘follower cities’; the replication plans are compulsory and are part of the evaluation.
- Consortia must have a clearly defined structure with roles and responsibilities properly spelled out for all involved entities.
Besides economic sustainability, proposals must also commit to scientific and technical requirements in support to reliability:

- Open and consistent data and interoperability of solutions in order to avoid locked-in customers.
- Contribution to common data collection systems (e.g. as those developed by European Commission under SCC2 of this Work Programme), measurement and disclosure methodology, in order to facilitate a common footprint calculation methodology and other metrics (especially for energy saving; CO2 reductions, financial savings, number of jobs created, environmental impact etc.).
- The performance monitoring should last for a period of at least 2 years. Longer term commitment (e.g. 5 years) will give an added value to the proposal. Consortia should develop an integrated protocol for monitoring energy, infrastructure, mobility and governance practices in the lighthouse projects, enabling documentation of improved performance over short and long term periods. The monitoring protocol should be robust and viable also after the end of the project, supporting and increasing municipal capacity over time Participants may be asked to introduce performance data into existing data bases (CONCERTO technical monitoring data base).

The building components of the proposals will be supported through the unit cost/m²;.

The Commission considers that proposals requesting a contribution from the EU of between EUR 18 to 25 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 proposals are expected to have the impacts described below:

- Deploy wide-scale, innovative replicable and integrated solutions in the energy, transport, and ICT;
- Trigger large scale economic investments with the repayment of implementation costs in acceptable time lines (to facilitate the bankability of the projects);
- Increase the energy efficiency of districts and of cities and foster the use of renewables and their integration energy system and enable active participation of consumers;
- Increase mobility efficiency with lower emissions of pollutants and CO2;
- Reduce the energy costs;
- Decarbonize the energy system while making it more secure and stable;
- Create stronger links between cities in Member States with various geographical and economical positions through active cooperation.

It is envisaged that the proposals will also bring societal benefits:

- Reduction of energy bills for all actors and especially for citizens and public authorities;
- Increase quality of life by creating local jobs (that cannot be delocalized) in cities;
- Increase air quality.

Type of action: Innovation Actions
EURO-5-2015 Overcoming the Crisis: New Ideas, Strategies and Governance Structures for Europe - ERA-NET on Smart Urban Futures

Relevant Forum Roadmap: City Logistics
Deadline: 7th January 2015

Specific Challenge: European cities are very important in policies aiming to create growth, jobs and a sustainable future. More than 70% of the EU’s citizens live in urban areas. Cities are centres of economic development, services, knowledge and creativity. But they are also the places of social polarisation, intercultural confrontations, poverty concentration, unemployment and environmental problems. Within a forward-looking perspective, the challenge is to identify the means and ways to make a European city an emblematic place for attracting jobs and economic activities, transforming it into a “hub of innovation” and ensuring social cohesion and cultural dialogue while preserving natural resources and limiting environmental damage for the next generations. European research and innovation should provide tools and methods for more sustainable, open, innovative and inclusive urban areas; a better understanding of the dynamics of urban societies and social changes and of the nexus of energy, environment, transport and land-use including the interplay with surrounding rural areas; an improved understanding of design and use of public space within cities also in the context of migration to improve social inclusion and development and reduce urban risks and crime; new ways to reduce pressures on natural resources and stimulate sustainable economic growth while improving the quality of life of European urban citizens; a forward-looking vision on the socio-ecological transition towards a new model of urban development reinforcing EU cities as hubs of innovation and centres of job creation.

Scope: Based on concrete urban cases, research and innovation will:
- Analyse the strengths and weaknesses of urban development as a way to shape the economic, social and environmental needs (cf. work, education, housing, mobility, ICT, energy, logistics, health shopping, access to public spaces, culture and leisure) of citizens and in particular the next generation in a sustainable way;
- Identify in which way European cities can become hubs of creativity and innovation;
- Contribute to the establishment of smart urban ecosystem services, where open data, big data and data access help to create thriving urban areas;
- Enhance understanding of urban structures, by creating new methods and tools, network approaches to cities and analysis of the economics of urban and peri-urban areas;
- Evaluate urban areas in terms of current and future “functionalities” opportunities, including urban public spaces and the employment of sustainable infrastructure and networks.

The following dimensions could be addressed: Urban Living Labs can be a promising option to design research and innovation projects dealing with the multi-dimensional challenges in urban areas; a strong comparative perspective can enhance mutual learning between cities and urban regions; a multilevel context, taking into account the global, European, national, regional and local contexts and actors, enables the examination of urban issues from different perspectives.

The proposed ERA-NET aims at coordinating the research efforts of the participating Member States, Associated States and Regions in the field described and to implement a joint transnational call for proposals with EU co-funding to fund multinational innovative research initiatives in this domain. Proposers are encouraged to implement other joint activities including additional joint calls without EU co-funding.
The Commission considers that proposals requesting a contribution from the EU of a minimum 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: The proposed research programme on Smart Urban Futures is expected to provide new insights on European urban dynamics, on the localisation of economic and social activities, and the implementation of urban innovations in small, medium and large cities, both in growing as well as shrinking urban areas. It will have an EU comparative and EU forward-looking dimension. Through the use of co-creation of knowledge urban stakeholders will be involved in the complete process from concept to implementation. Emphasis will be put on the scaling-up of urban best-practices.

Type of action: ERA-NET Cofund
GALILEO-2-2015 Small and Medium Enterprise (SME) based EGNSS applications

Relevant Forum Roadmap: High Capacity Transportation (HCT) Roads
Deadline: 4th February 2015

Specific Challenge: European society and industry are facing new societal challenges, requiring more innovation, productivity and competitiveness, whilst using fewer resources and reducing environmental impact. GNSS offers various possibilities for the development of new space enabled applications, which will enhance Europe’s capacity to address major societal challenges in focus areas such as health, citizen safety, mobility, smart cities, sustainable resources management, regional growth, low-carbon energy infrastructure planning and protection, disaster management and climate action including natural catastrophes.

Satellite navigation provides continuous, real-time, reliable, accurate and globally available position, velocity and time. The technology fits important societal and market needs.

Scope: This topic will explore new applications in niche market sectors and business models in any application domain. Proposals should aim at developing sophisticated, innovative applications, such as mass market location based services (LBS) products, feasibility studies, market tests etc. Application development should be seen in a broad context - it includes the development, adaptation and/or integration of new software, hardware, services, datasets etc. Proposals should address emerging user needs and, specifically, take advantage of the Galileo and EGNOS capabilities and their distinguishing features. A specific emphasis will be given to support development of technological breakthrough into viable products with real commercial potential, where SMEs, which are considered as the key players for innovation in this domain, play a pivotal role, given their flexibility and adaptability.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 1 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: Activities should aim at developing highly innovative and adaptive applications taking advantage of the Galileo and EGNOS. The proposal should be led by an SME and have a clear intention to commercialise the products and services developed, including a business plan. Additional partners within the consortium should contribute directly to the needs identified by the SME in the lead, in order to fulfil the above objective of commercialisation.

Type of action: Innovation Action
GALILEO-1-2015 EGNSS applications

Relevant Forum Roadmap: High Capacity Transportation (HCT) Roads,
Drivers of innovation on a liberalised rail market

Deadline: 4th February 2015

Specific Challenge: European society and industry are facing new societal challenges, requiring more innovation, productivity and competitiveness, whilst using fewer resources and reducing environmental impact. GNSS offers various possibilities for the development of new space enabled applications, which will enhance Europe’s capacity to address major societal challenges in focus areas such as health, citizen safety, mobility, smart cities, sustainable resources management, regional growth, low-carbon energy infrastructure planning and protection, disaster management and climate action including natural catastrophes.
Satellite navigation provides continuous, real-time, reliable, accurate and globally available position, velocity and time. The technology fits important societal and market needs.

Scope: Proposals should aim at developing new innovative applications, with future commercial impact. The topic addresses application development in all market segments, such as: transport (road, rail, maritime, aviation), high precision surveying, location based services (LBS), agriculture, emergency services etc responding to user requirements. Application development should be seen in a broad context - it includes the development, adaptation and/or integration of new software, hardware, services, datasets, etc. The use of EGNOS and Galileo Early Services is a key priority for this topic.
Research and innovation activities within this topic should take into consideration possibility of:
1. Exploitation of synergies with other space-based services and systems in order to enable multi-use character of EGNOS and Galileo-enabled applications in all market segments,
2. Exploitation of the distinguishing features of EGNOS and Galileo signals and operational advantages in downstream applications,
3. Preparation for the use of early services, ensuring a greater precision and availability of signals,
4. Implementation of pilot projects for further development of EGNSS based applications,
5. Standardisation, certification, legal and societal acceptance, which will foster EGNSS adoption.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1.5 and 4 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: Activities should aim at developing highly innovative and adaptive applications taking advantage of the Galileo and EGNOS. The proposal should be led by an SME and have a clear intention to commercialise the products and services developed, including a business plan. Additional partners within the consortium should contribute directly to the needs identified by the SME in the lead, in order to fulfil the above objective of commercialisation.
Type of action: Innovation Action
GALILEO-3-2015 Releasing the potential of EGNSS applications through international cooperation

Relevant Forum Roadmap: High Capacity Transportation (HCT) Roads,
Deadline: 2d April 2015

Specific Challenge: Although Galileo is a European programme, it has a strong international dimension. International cooperation in the field of Galileo-enabled applications is therefore an essential element facilitating its breakthrough to new and emerging markets and strengthening Europe’s position as a major space player.

Scope: Activities under this topic will enable the development of innovative applications within international context and related standards with high international impact, ensuring that the EGNSS services are well known and can be used throughout the world. The objective is to support new proposals consisting of demonstrators of applications, adaptations of applications to a specific and local context outside of the European Union and the implementation of applications benefiting from multiple constellations, including Galileo. GNSS should be used as the primary positioning technology in the application and positioning should be a key enabler of the application. Third countries will be guided and supported in adapting services and developing applications corresponding to local needs and ensure that no unnecessary restriction to the use of the EGNSS is applied. Focus will be on regions of the world, which represent an attractive market for the European industry.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 1.5 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: Proposals are expected to foster application development through international cooperation and create a broad acceptance of EGNSS in non-European countries. The consortium should aim to transform the research results into innovation in third countries, through the networking of relevant technology developers with local academia, incubators, SMEs, representatives from civil society as well as local authorities, notably for the provision of public services, best practices and technology through the establishment of self-sustainable partnerships and collaborative initiatives.

Type of action: Innovation Action
FETOPEN-1-2014 FET-Open - Novel ideas for radically new technologies - Research Projects

Relevant Forum Roadmap: All Roadmaps
Deadline: 29th September 2015

Specific Challenge: Proposals are sought for collaborative research with all of the following characteristics:

- Long-term vision: the research proposed must address a new, original or radical long-term vision of technology-enabled possibilities that are far beyond the state of the art and currently not anticipated by technology roadmaps.
- Breakthrough S&T target: research must target scientifically ambitious and technologically concrete breakthroughs that are arguably crucial steps towards achieving the long-term vision and that are plausibly attainable within the life-time of the proposed project.
- Foundational: the breakthroughs that are envisaged must be foundational in the sense that they can establish a basis for a new line of technology not currently anticipated.
- Novelty: the research proposed must find its plausibility in new ideas and concepts, rather than in the application or incremental refinement of existing ones.
- High-risk: the potential of a new technological direction depends on a whole range of factors that cannot be apprehended from a single disciplinary viewpoint. This inherent high-risk has to be countered by a strongly interdisciplinary research approach, where needed expanding well beyond the strictly technological realm.
- Interdisciplinary: the proposed collaborations must be interdisciplinary in the sense that they go beyond current mainstream collaboration configurations in joint science- and technology research, and that they aim to advance different scientific and technological disciplines together and in synergy towards a breakthrough.

This call is open to early-stage research on any new technological possibility.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 and 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amount.

Expected impact: Proposals must aim at one of the following two impacts:

- Initiating a radically new line of technology by establishing Proof-of-Principle of a new technological possibility and its new scientific underpinning, or
- Kick-starting an emerging innovation eco-system of high-potential actors around a solid baseline of feasibility and potential for a new technological option, ready for early take-up.

The active involvement of new and high-potential research and innovation players, which may become the European scientific and technological leaders of the future, is encouraged. Impact is also sought in terms of take up of new research and innovation practices and, more generally, from making leading-edge science and technology research more open, collaborative, creative and closer to society.

Type of action: research and Innovation Action
Space-SME-2015-1 Horizon 2020 dedicated SME Instrument - Phase 1 2015

Relevant Forum Roadmap: Drivers of innovation on a liberalised rail market
Deadline: 29th September 2015

Specific Challenge: To engage small and medium enterprises in space research and development, especially those not traditionally involved in it and reduce as much as possible the entry barriers to SMEs for Horizon 2020 funding.

The specific challenge of the actions envisaged under this call could cover any aspect of the Specific Programme for Space (Horizon 2020 Framework programme and Specific programme). However, it is considered that actions in the areas of applications, especially in connection to the flagship programmes Galileo and Copernicus, spinning-in (i.e. application of terrestrial solutions to challenges in space) and the development of certain critical technologies could be adequately suited for this call.

Scope: The SME instrument consists of three separate phases and a coaching and mentoring service for beneficiaries. Participants can apply to phase 1 with a view to applying to phase 2 at a later date, or directly to phase 2.

In phase 1, a feasibility study shall be developed verifying the technological/practical as well as economic viability of an innovation idea/concept with considerable novelty to the industry sector in which it is presented (new products, processes, design, services and technologies or new market applications of existing technologies). The activities could, for example, comprise risk assessment, market study, user involvement, Intellectual Property (IP) management, innovation strategy development, partner search, feasibility of concept and the like to establish a solid high-potential innovation proposal aligned to the enterprise strategy and with a European dimension. Bottlenecks in the ability to increase profitability of the enterprise through innovation shall be detected and analysed during phase 1 and addressed during phase 2 to increase the return in investment in innovation activities.

The proposal should contain an initial business plan based on the proposed idea/concept.

The proposal should give the specifications of the elaborated business plan, which is to be the outcome of the proposal and the criteria for success.

Funding will be provided in the form of a lump sum of EUR 50,000. Proposals should last around 6 months.

In phase 2, innovation proposals will be supported that address the challenges identified in the specific programme for space and that demonstrate high potential in terms of company competitiveness and growth underpinned by a strategic business plan. Activities should focus on innovation activities such as demonstration, testing, prototyping, piloting, scaling-up, miniaturisation, design, market replication and the like aiming to bring an innovation idea (product, process, service, etc) to industrial readiness and maturity for market introduction close to deployment and market introduction, but may also include some research. For technological innovation a Technology Readiness Levels of 6 or above (or similar for non-technological innovations) are envisaged; please see part G of the General Annexes.

Proposals shall be based on an elaborated business plan either developed through phase 1 or another means. Particular attention must be paid to IP protection and ownership; applicants will have to present convincing measures to ensure the possibility of commercial exploitation ('freedom to operate').

Proposals shall contain a specification for the outcome of the proposal, including a first commercialisation plan, and criteria for success.
The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 2.5 million would allow phase 2 to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Proposals should last between 12 and 24 months.

In addition, in phase 3, SMEs can benefit from indirect support measures and services as well as access to the financial facilities supported under Access to Risk Finance of this work programme. Successful beneficiaries will be offered coaching and mentoring support during phase 1 and phase 2. This service will be accessible via the Enterprise Europe Network and delivered by a dedicated coach through consultation and signposting to the beneficiaries. The coaches will be recruited from a central database managed by the Commission and have all fulfilled stringent criteria with regards to business experience and competencies. Throughout the three phases of the instrument, the Network will complement the coaching support by providing access to its innovation and internationalisation service offering. This could include, for example, depending on the need of the SME, support in identifying growth potential, developing a growth plan and maximising it through internationalisation; strengthening the leadership and management skills of individuals in the senior management team and developing in-house coaching capacity; developing a marketing strategy or raising external finance.

Expected impact:

- Enhancing profitability and growth performance of SMEs by combining and transferring new and existing knowledge into innovative, disruptive and competitive solutions seizing European and global business opportunities.
- Market uptake and distribution of innovations tackling the specific challenges in space in a sustainable way.
- Increase of private investment in innovation, notable leverage of private co-investor and/or follow-up investments.
- The expected impact should be clearly described in qualitative and quantitative terms (e.g. on turnover, employment, market size, IP management, sales, return on investment and profit).

Type of action: SME instrument (70%)
Annex 1: Forum areas not covered in H2020

An identified number of areas mentioned in the roadmaps, which are not covered in the Horizon 2020 funding programs, where found.

- E-business and home deliveries
- Long Combination Vehicles
- HCT – High Capacity Transport
- Remotely Operated Vehicles had only been covered in the Blue Growth program (maritime research)

These areas are of relevance, however during the scanning and selection we used the following three categories:
  - Not relevant
  - May be of interest
  - Relevant

The “not relevant” areas are those which are not explicitly covered by a Horizon 2020 funding program. However, most of Horizon 2020 programs have a wide scope to be targeted through different angles. Therefore, those “not relevant” areas could fit in one of the identified calls as one part of the project. “May be of interest” means that we identified that area as might not be covered by any Horizon 2020 program but the Forum needs to have a closer look at it. The “relevant” areas are those we identified as being completely uncovered by Horizon 2020 programs.

For further information, please read the enclosed Excel document.
Annex 2: New potential FORUM focus area

Outside the assignment, we identified an area which is covered by the Horizon 2020 program, but not in the Forum Roadmaps and that is the focus area of **Transport societal drivers**.

After a discussion with Esa Stenberg, Vinnova, the conclusion is that this may be an area of interest for the Swedish Forum organisations. The societal driver trend has been an R&I and business area for other sectors e.g. instance food, energy, etc. where the consumer behaviour partly moving towards more conscious choices lead to the ecological food and green energy now are common features. This area has not been elaborated further in this assignment. More information could be found at Mobility for Growth, 9.1 -2015. Please follow link: