

ports in other important regions like Asia and the Americas. The results should include appropriate mechanisms to collect, manage and distribute the data on a long term and to show trends over a substantial timeline and a business case to ensure sustainable continuity. For this activity, collaboration with Mediterranean Partner Countries would be welcome.

- The second action should support both the implementation of the International Labour Organization 'Guidelines for Training of Workers in the Port Sector' and the objective of the 'Social Agenda for maritime transport' for the establishment of a mutually recognisable framework on the training of port workers in different fields of port activities. It should identify anticipated human resource demand profiles, skill and training needs for EU ports in the 2030 horizon. It should facilitate consensus building on the next steps that need to be made in accomplishing the objectives of a sustainable and efficient EU port system.

SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference

Level 2 - CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this action is to organise two competitions for transport research awards to be announced at the TRA conference in 2014:

- A research student competition with the goal of stimulating the interest among young researchers/students in the field of sustainable surface transport.
- A competition for senior researchers in the field of innovative surface transport concepts based on results only from EU-funded projects.

Both competitions will cover all surface transport modes (road, rail and waterborne) and cross-cutting issues in line with the EC policy objectives for smart, green and integrated transport. The organisation of these awards should ensure high-quality competition and very good media coverage before, during and after the TRA conference.

Expected impact:

- Stimulate young researchers/students to submit their research work to the competition.
- Encourage partners from EU-funded projects to further develop innovative ideas from their projects.
- Directly support the TRA conference as a successful, high quality scientific event which is considered as the first Transport research conference in Europe.
- Efficiently disseminate knowledge and results of European and National research projects in the area of Sustainable Surface Transport and thus improve the coordination of research, technology development and innovation in the Surface Transport sector in Europe.

THE 'EUROPEAN GREEN CARS INITIATIVE'

The 'European Green Cars Initiative' includes three major research and development areas within its RTD pillar: 1) development of electric vehicles for road transport; 2) research for heavy duty vehicles for medium and long distance road transport; and 3) logistics and modality.

GC.SST.2013-1. Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Wide-scale adoption of pure Electric Vehicles (EVs) requires advanced charging solutions which provide a user experience similar to today's cars, particularly in terms of range. In the long term, electric vehicles might be able to collect energy from the road, be it in a conductive or contactless fashion. Compared to the current paradigm of larger installed storage capacity or fast charge or switchable batteries, advanced charging solutions might improve driving range and battery lifetime of the full electric vehicle (FEV) as well as its energy efficiency and price, given the need for a smaller battery.

Research will address the following aspects at the system level:

- Analysis of the feasibility of the possible technological options of on-road charging (including transferring solutions currently proposed for stationary or rail mobile applications to light duty vehicles and possible extension to buses and medium trucks for urban applications) and their testing and comparison in terms of the main parameters such as cost, transferable power and efficiency, and infrastructure requirements.
- The impact on the vehicle in terms of architecture and capacity of the on-board energy storage systems should be assessed.
- The ergonomics of driving while in charging mode and potential links with (semi) automated driving benefiting from the presence of the charging line; the potential of related technologies like platooning should be explored.
- Development and technological demonstration of one selected charging option in terms of the required on-board and on-infrastructure energy transfer technology, maximizing efficiency and instantaneous energy transfer rates.
- A comprehensive assessment of impacts of the selected on-road charging option related to:
 - Economics (capital and operating cost impacts on the vehicle and on the infrastructure) including business cases for the gradual introduction in urban and extra-urban roads
 - The distribution network and the electricity generation. High power connections will be required for on road charging and some of the power use may be shifted to peak hours. The assessment should include opportunities for renewable energy use in different stages of deployment.
 - Assessment of pavement construction and maintenance requirements, including interaction with other technological infrastructure in or below it. Assessment of impacts on road infrastructure should be part of the demonstration of the charging technology.
 - Environment, including a life cycle assessment of environmental impacts, risks and benefits of the entire proposed solution for continuous charging of the vehicle, including the vehicles, the infrastructure and the energy production and distribution, comparing it with the current reference cases of slow and fast charging FEVs and range extended/plug in hybrids.
 - Safety (including EMC) and health impacts on electronic systems, vehicle occupants and on persons and animals close to the infrastructure.
- Assessment of the needed ICT solutions to support the driver and charging energy costs, including data security and privacy issues.
- Measures enabling the staged deployment of charging infrastructure and the required harmonisation and standardisation

Strong links should be established with running EU and national funded projects in the same area, particularly as far as charging technologies are concerned. Furthermore, the project is expected to establish cooperation and to coordinate with relevant projects under the NMP, Environment, ICT and Energy programme to jointly support the 'European Green Cars Initiative'. The participation of SMEs is particularly encouraged.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact:

- A global feasibility and demonstration study of the on-road charging concept capable of orienting future activities while highlighting the relevant social, environmental and economic issues and any technological gaps.
- Provide evidence on environmental, economic and energy system benefits of advanced on-road charging options.
- Advanced steps for bridging technological gaps and bringing about a rational solution for both the grid and the road infrastructure.

GC.SST.2013-2. Next generation electric motors

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The energy efficiency and affordability of pure electric vehicles can be improved by next generation of electric motors. Improved materials or substitutes could deliver higher and tailored output while reducing weight and volume. The scarcity and the recyclability of such materials should also be addressed considering the mass introduction of next generation electric vehicles.

Research will focus on:

- Weight reduction and power density increase.
- Increased efficiency, including smart packaging of power electronics and integrated thermal management.
- Optimised design and processes for manufacturing and dismantling.
- Novel or substantially improved materials for permanent magnets replacing or greatly reducing rare earths content, or innovative magnet-free designs.

Expected impact:

- Increased energy efficiency over a wide range of EV operating conditions.
- Reducing cost towards mass use in next generation electric vehicles.

GC.SST.2013-3. Future light urban electric vehicles

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The objective is to close the gap between bikes/mopeds and cars by developing light, affordable, safe, ergonomic and energy efficient electric vehicles (at least two seats and three wheels) meeting customer expectations in all weather conditions. The focus is on passenger applications (although freight delivery derivatives can be expected) and on the global vehicle architecture and design.

Research under this topic will use technologies and components which are either off-the-shelf or covered in previous calls (no specific technology development of components) to address collectively the following aspects:

- Optimised weight through innovative materials and system integration.
- Safe and integrated chassis and body shell design to achieve similar occupant safety level than in normal passenger cars despite worse conditions by using optimised crash detection mechanisms and actuators (restraints and structures); high compatibility design.
- Extremely low energy consumption with purely electrical braking providing enhanced recuperation capability with respect to the state of the art and advanced stability systems. This research should also consider the possible failure modes and give attention to any regulatory requirements for such systems.
- Assembly line capable designs based on low energy consuming manufacturing processes.
- New business approaches, based on reasonably low budgets and leading to novel supply chains

Expected impact: Vehicle prototypes will demonstrate the following performance:

- 40-80 Wh/km energy consumption in real urban driving corresponding to the given weight bracket.
- At least 150 km pure electric range in real urban driving including the use of comfort accessories.
- Compelling acceleration (0 to 100 km/h in 10 s).
- Best in class protection for the driver and passenger and for pedestrians in Euroncap crash tests, with highly compatible design.

GC.SST.2013-4. Demonstration of electric buses as urban public transport

CP - Call: FP7-TRANSPORT-2013-MOVE-1

Contents and scope: The White Paper 'Roadmap to a single European transport area' calls for a transition from a car based personal mobility to a public transport based mobility. Public transport plays also an important role in mitigating the negative effects of transport in urban areas such as congestion, greenhouse gases and pollutants emissions. Clean, energy efficient and silent buses will contribute to meet these objectives. A large demonstration project will facilitate the market take up of electric buses in Europe. The fleets of urban buses will include the main types of electrification technologies dealing with different scenarios of interaction with the electricity grid. The proposal time frame should be designed to take on board latest development in EU or national programs and latest available innovative industrial technologies for all vehicle categories considered. Existing local or regional demo projects and new projects could be coordinated in this demonstration project.

The activities to be carried out should include:

- Demonstration of the use of electricity as energy vector for urban buses in a wide range of real-life operating conditions. The project could demonstrate innovative electric buses with different types of electrical power train systems covering plug in hybrid to full electric technologies. Fuel cells buses should be excluded from the proposal. Focus should be on vehicles with interaction with the grids. The demonstration sites should provide various climatic and geographical conditions. Coordination of existing local, regional or national demonstration programs is an asset.
- Assessment of the infrastructure optimisation and bus-to-grid interaction scenarios.

- Development of standards, investigation of safety issues, and technology validation for performance, durability and costs.
- Assessment of the impact on energy and environment, including a well-to-wheels analysis.
- Communication, dissemination of information, and education.

The project should have a predominant demonstration component. The marginal cost associated with the innovation element compared to state-of-the-art vehicles will be considered as eligible cost. A typical consortium could include cities or regional authorities, fleet operators, vehicle and equipment manufacturers, utilities, research centres and universities.

This activity should assimilate the results of previous FP7 research projects on buses and establish links with the projects under topic SST.2012.3.2-1 'Coordinating innovation for efficient bus systems in the urban environment', topic GC-SST.2012.1-7 'Demonstration of urban freight electric vehicles for clean city logistics', and FP7 project 'Green emotion'.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact: This project should clarify the viability of the different types of electrical buses for immediate market introduction within urban areas. The expected impact of this project is an acceleration of the market roll-out of electric buses in order to meet EU policy objectives. The project should facilitate pre-commercial procurement and foster innovation in the public sector. The project should also help to clarify possible support for further deployment of electric buses in European cities through European Investment Bank instruments.

GC.SST.2013-5. Configurable and adaptable truck

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Today trucks are designed and optimised towards a limited variance set of usage and for maximum payload. In the future there will be an increasing need for optimised load efficiency for each mission of a truck, and for optimising the freight carried on a finite length of road. The objective of research is to develop innovation solutions for the truck and load carrier design to have an integrated approach on configuration and adaptation of the vehicle concepts. Both the design phase (e.g. new tractor-trailer architecture) and the operation phase should be considered. A key aspect in the design phase is to have a modular drive line for rightsizing the vehicle combination with respect to the transport assignment while keeping vehicle performance (e.g. stability). In the operation phase, the vehicle combination should be adapted to the actual driving environment (i.e. traffic situation, topology, and payload). The implications of vehicle and conveying concepts for the infrastructure should also be considered. The project should also investigate legal constraints and harmonisation issues across the EU, e.g. engine certification, vehicle combination dimensions, etc. and identify possible deployment scenarios.

The following issues should be addressed by research:

- Optimised trucks design for transport mission.
- Configurable truck (tractor and trailer) and load carrier concepts.
- Energy tailored driveline, with a modular approach for rightsizing.

- Total truck – trailer architecture including modular powertrain.
- Distributed driveline including high level of hybridisation.
- Consideration of the infrastructure (pavement and bridge) needs: including methods to overcome any negative consequences from future types of trucks which may result from different distributions of axle loading (distributed driveline) or overall weights and dimensions.

The project should include the development of a demonstrator of complete vehicle combination and requirements on modular tractor and trailer design.

Expected impact: Viable concepts for better matching and combination of truck and load carrier to different types of transport assignments together with the infrastructure construction and maintenance aspects that will lead to an improved load efficiency both from an energy (estimated to 25% less energy/t.km, drag reduction, driveline and transport mission rightsizing,) and infrastructure service usage point of view.

GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The aim of research is to develop innovative complete high efficient energy conversion concepts for heavy duty trucks.

Research may include:

- innovative power converters (with a level of demonstration, and therefore funding, coherent with the level of maturity of the concept);
- engine downsizing concepts, e.g. dynamic cylinder deactivation;
- refined combined cycle systems, with e.g. heat, steam or fuel cell systems;
- drive train concepts reducing the transient environment for the engine, e.g. by dynamic energy storage offering optimisation potential of the engine; etc.

These converters must be designed to be operated in combinations with highly efficient integrated after-treatment solutions. A new generation of total driveline control architectures should be developed which utilise the potential of the new energy converter concept in an optimal combination with truck energy usage and energy recovery systems on-board.

Expected impact: Demonstration of new innovative energy conversion concepts which reach a system efficiency well above 50% at acceptable costs with the capability of achieving Euro VI emission levels in real life by PEMS⁴⁵ measurements with a 1.2 multiplier.

GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: Ports, freight terminals and the transport industry are confronted with

- ever increasing volumes to handle (continuous volume growth over the years as well as increased vessel sizes);

⁴⁵ Portable Emissions Measurement Systems

- new logistic concepts applied by shippers such as co-modality and synchro-modality, the latter offering companies the ability to time and again select the most appropriate mode of transport for a particular moment and circumstances;
- the need for innovative transshipment technologies allowing cost efficient integration of small and voluminous container flows and the sharing of transport volumes which may e.g. require stop and go operations in addition to point to point shuttle services;
- the fast growing development of e-freight applications and networks for a secure, reliable and efficient platform for digital information exchange for global trade and logistics; and
- the growing development of port - hinterland networks.

The objective of this topic is to increase the individual and co-operative performance quality and throughput of ports and terminals through the development of innovative technologies, infrastructures and e-freight solutions. Research under this topic will address the following aspects:

- Next generation of environmental friendly safe and efficient “Automated Guided Vehicles” for the transport of goods within ports/terminals or beyond fenced spaces, i.e. between ports/terminals, and supportive infrastructure.
- New transshipment technologies, new management and software tools, including information systems to improve visibility and access to data in order to promote the generation and use of multimodal routes for goods transport.
- Low-cost innovative connectivity solutions based on existing, freely available components, which may include upload and download facilities, document sharing facilities with access authorisation mechanisms, electronic document readers, a basic data model that is in line with existing international standards, and dashboard functionality. Functional requirements and main components for modular connectivity solutions in international trade should be addressed.

Cooperation with Mediterranean partner countries is encouraged.

Expected impact:

- Efficient and safe port and terminal operations.
- Efficient, safe low environment impact use of transport means within and between ports and terminals.
- Contribution to the open up of e-freight developments to a wider community, notably SMEs and link them up with networks that are being developed predominantly by big companies.
- Development of easy to use and affordable software solutions and demonstrate connectivity solutions (in particular for SMEs in the transport sector) in different trade lanes, within the European Union, and between European Union and third countries, for different purposes, with special attention for the ease of use, low entry barrier, possibilities for quick connect and disconnect, and possible business models.
- Assessment of the benefit for international trade of a general roll out of this type of connectivity solution.